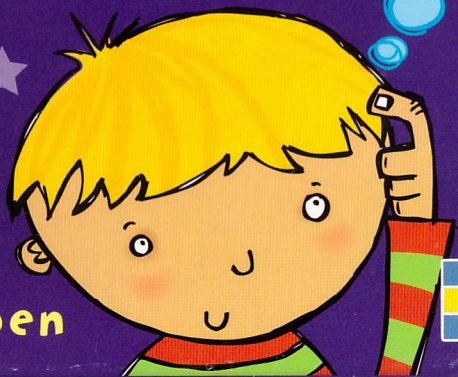
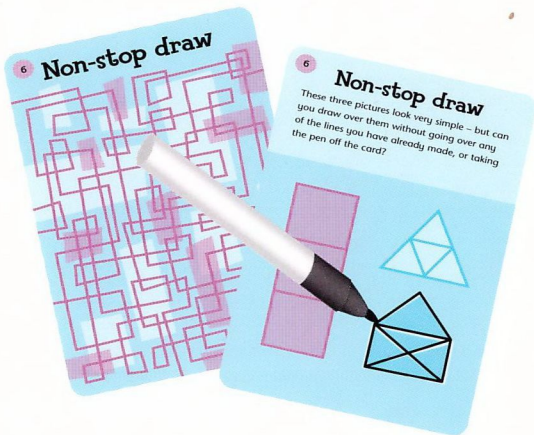


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9 780746 089132 >



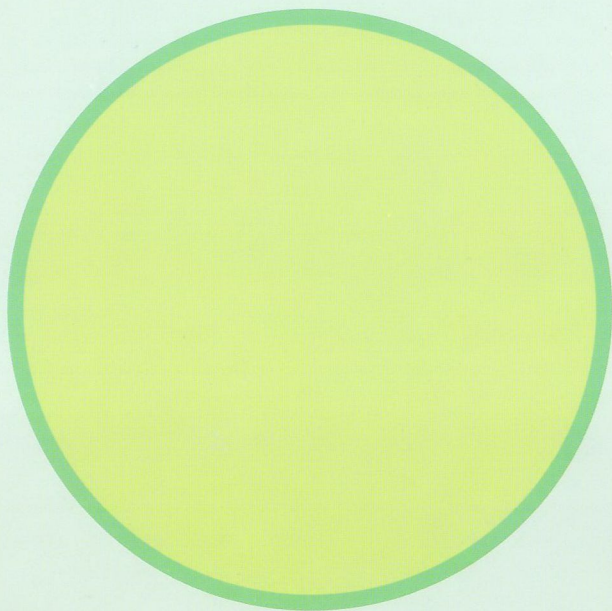
Splitting a circle



1

Splitting a circle

Can you divide this circle into seven sections, using just three straight lines?

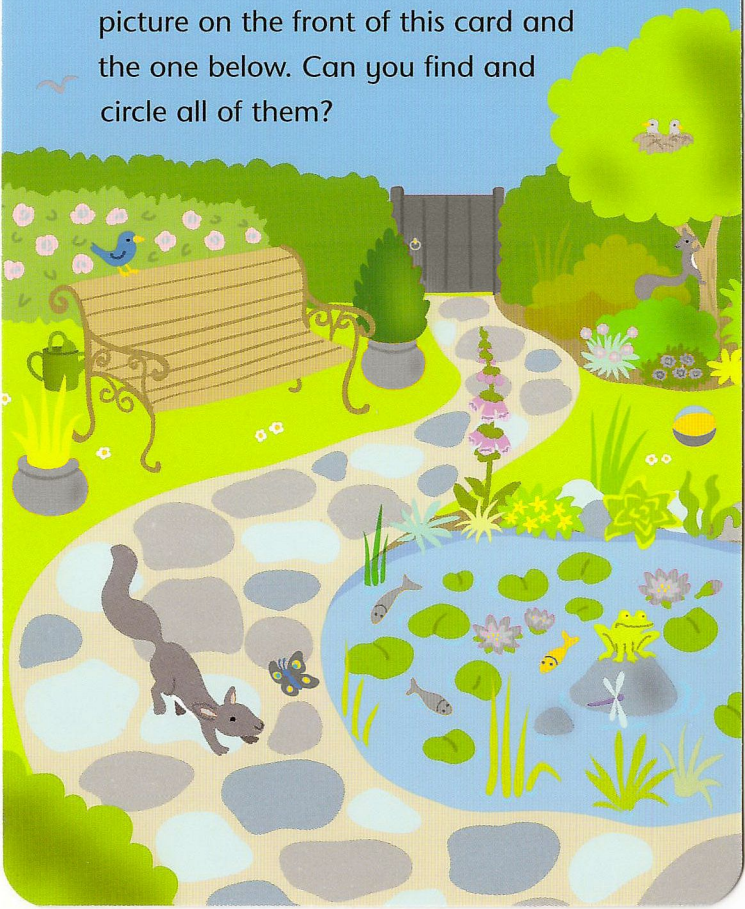


Spot the difference



Spot the difference

There are ten differences between the picture on the front of this card and the one below. Can you find and circle all of them?



Magic bean

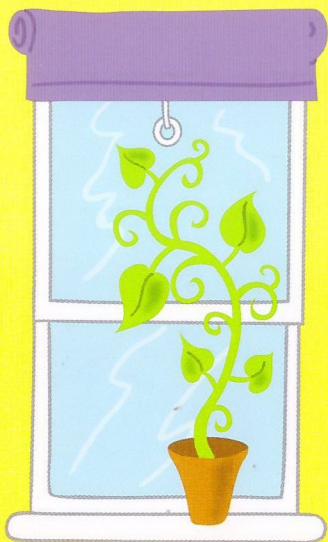


Magic bean

Rob's dad gave him a magic bean for his birthday. He promised him that the bean would grow into a huge plant very quickly. That Tuesday night, Rob planted one of the beans in a flowerpot and put it on the windowsill in his bedroom. When Rob checked the bean the next morning, he could see a little green shoot poking out of the soil. The following morning, the shoot had exactly doubled in size. The morning after that, it had doubled in size again. By Friday of the following week, the plant completely filled his room!

On which day did the magic plant half-fill Rob's room?

Answer:

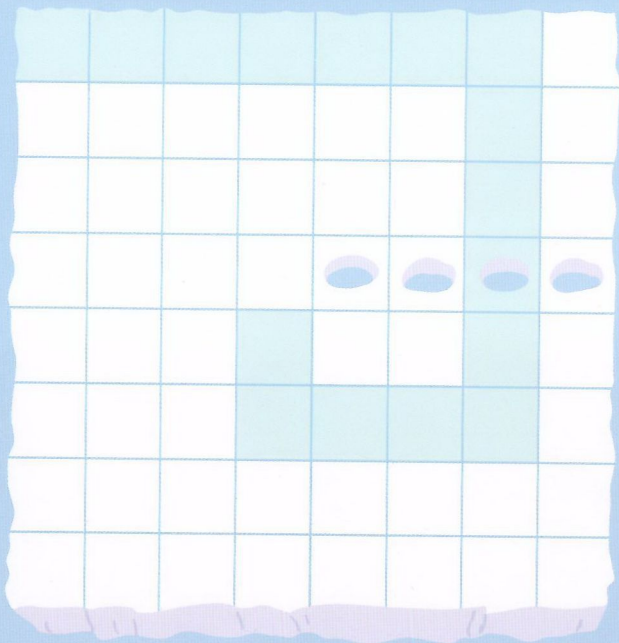


Silly squabble



Silly squabble

Four selfish polar bears can't learn to share their fishing holes. The only way to settle the argument is to divide the ice into four pieces, each with its own fishing hole. Each piece must have 16 squares, and they must all be the same shape. One piece has been drawn for you – can you draw the others?



The magic number

 $+$ \div $?$ $-$ $=$ \times

The magic number

Think of any number you like.
Multiply this number by 2. Write
your answer in the next column:

Add 12 to the answer:

Take away 3 from the answer:

Add 5 to the answer:

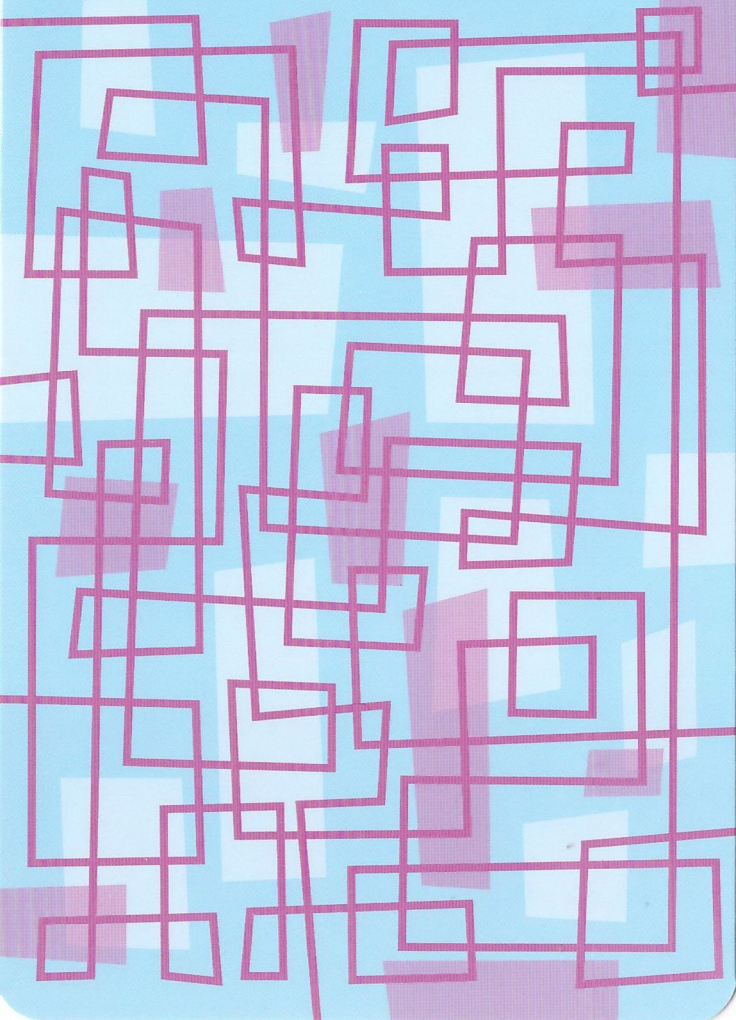
Divide the answer by 2:

Take away the *original* number:
What did you get?

Now try again starting with a
different number. What did you
get this time?

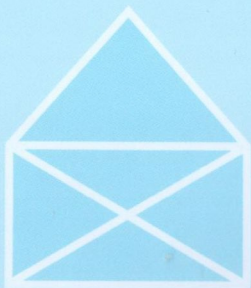
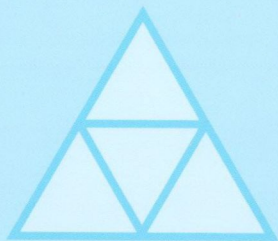
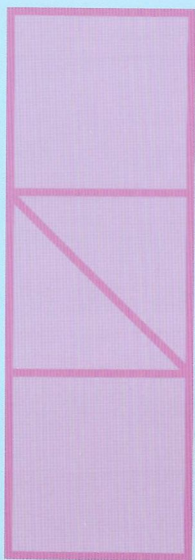
Try it again.

Non-stop draw



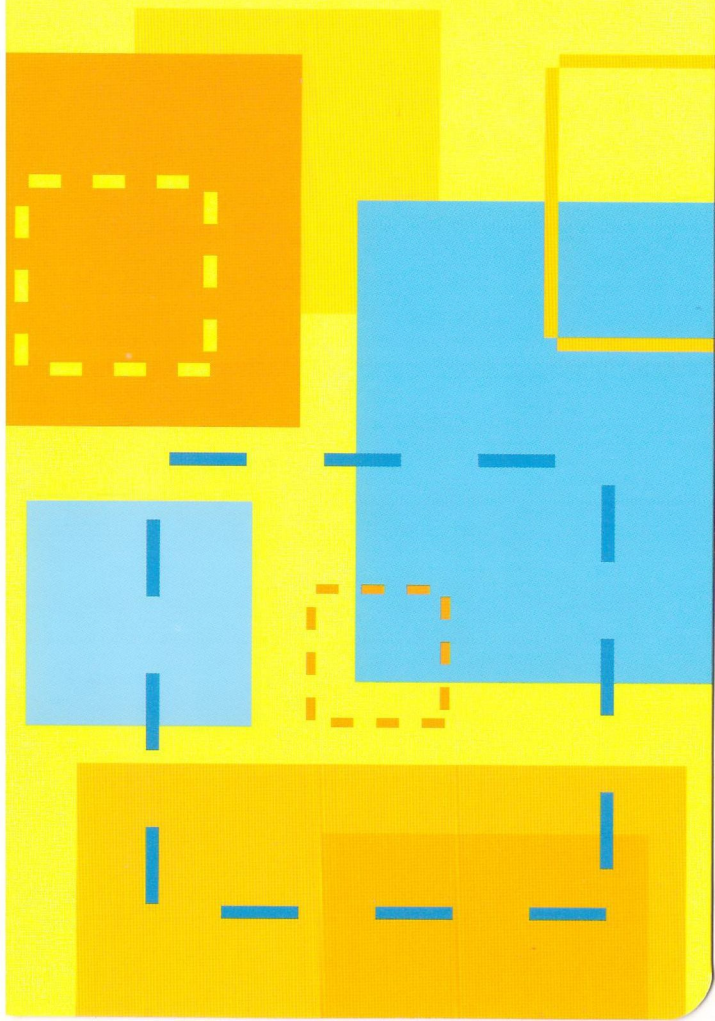
Non-stop draw

These three pictures look very simple – but can you draw over them without going over any of the lines you have already made, or taking the pen off the card?



7-8

Making squares

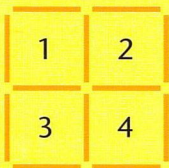


7

Making squares 1

Can you change the number of squares from five to seven by moving just two lines? You cannot leave any unconnected lines.

Try the puzzle here:



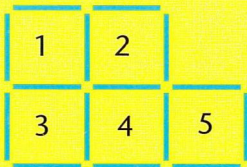
(Square 5 is the outer square.)

8

Making squares 2

Can you make these six squares into three squares, by taking away three of the lines? You cannot leave any unconnected lines.

Try the puzzle here:

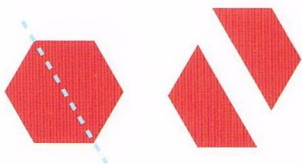


(Square 6 is the outer square around 1-4.)

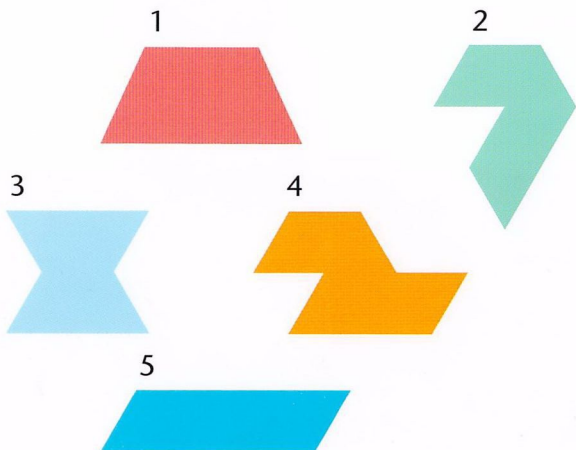
Half hexagon

Half hexagon

Cutting a hexagon in half, like this, makes two pieces that are exactly the same size and shape.



Some of the shapes below have been made from the two halves of the hexagon and some of them haven't. Draw circles around the shapes that are not made from the pieces shown above.

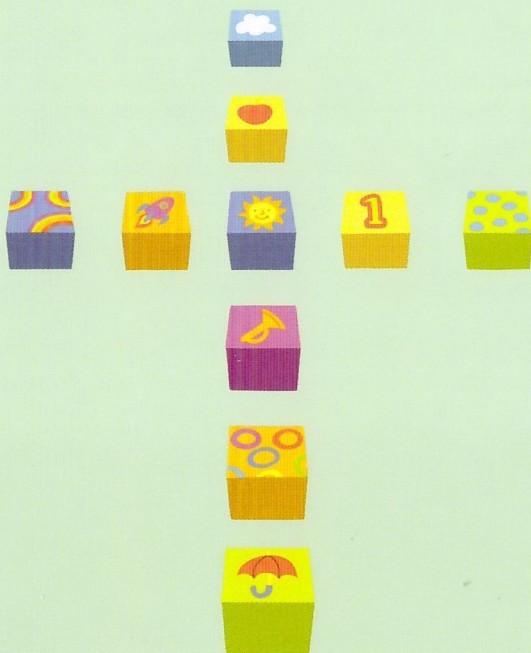


Toy blocks



Toy blocks

There are ten toy blocks below. Can you move (not remove) one block to turn the pattern into an even plus shape (+), with six blocks in each row?



Riddles



Silly sentence

Riddles

1. Alex lives on the twelfth floor in a tall building. Every day when he leaves his home, he presses the button in the elevator that takes him to street level. When he comes home at the end of the day, he pushes the button that takes him to the tenth floor, and walks the last two flights of stairs. Why does he do this?

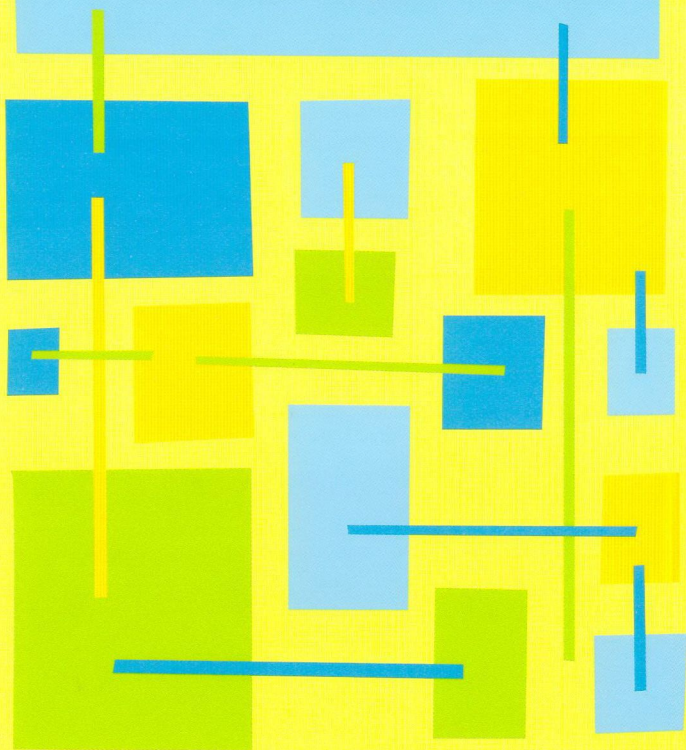
2. Nikki was walking her dog through some fields on a bright, sunny morning when she came across an old hat and scarf and some lumps of coal lying on the ground. Why were they there?

Silly sentence

'This senttence has three misteaks in it.'

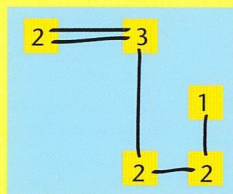
Can you see what they are?

Drawing lines

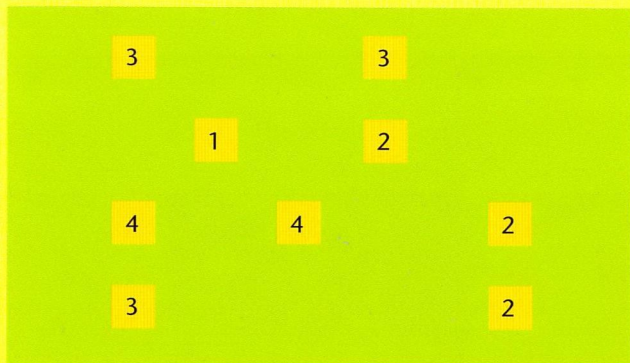


Drawing lines

Each yellow square below has a number inside. The numbers show how many lines need to be attached to each square to connect them together. Lines can only go horizontally or vertically – they cannot bend or go diagonally. Up to two lines (but no more) can leave a square from the same side. For example:



Now see if you can draw in the lines on the diagram below:

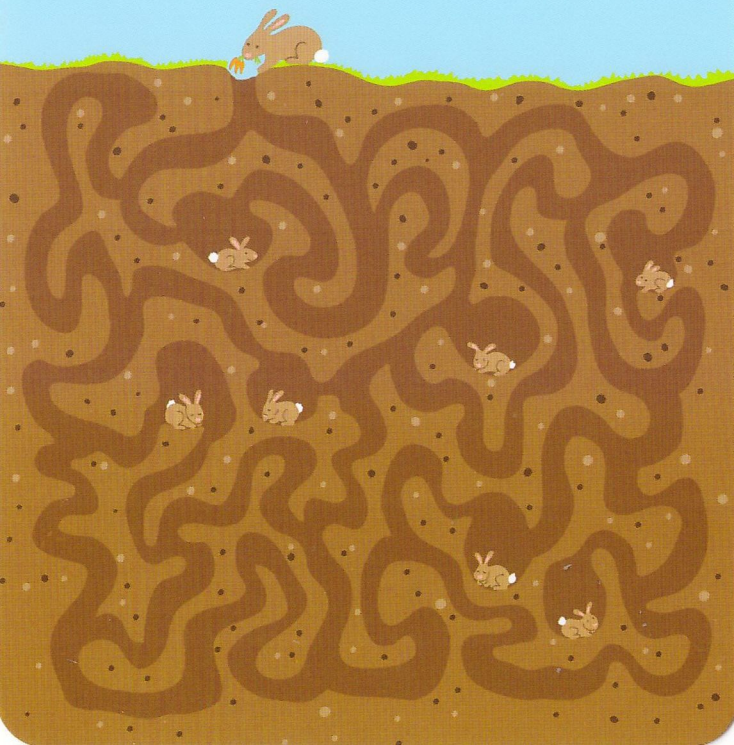


Rabbit burrow

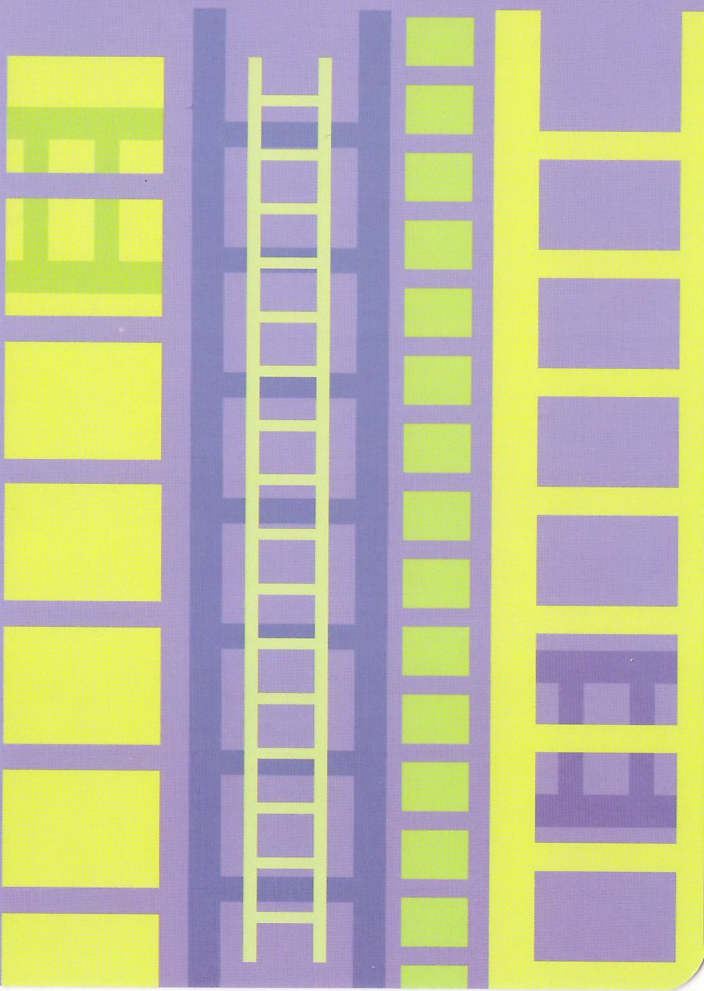


Rabbit burrow

Seven baby rabbits are waiting for their food.
Can you draw a route for the mother rabbit to follow that takes her past all the baby rabbits?
She cannot use any part of a tunnel more than once.



Word ladders

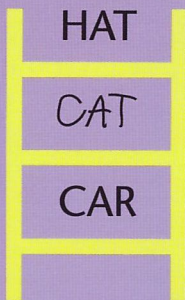


Word ladders

The aim is to fill in the spaces on the ladders with a new word until you make the word at the bottom.

You can only change one letter at a time.

For example:



See if you can complete these word ladders.

Write your answers in the spaces.

1

PAW

JAM

2

WING

BIRD

3

HEAT

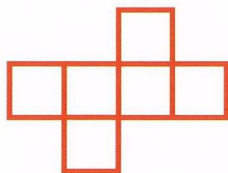
COLD

Crazy cubes

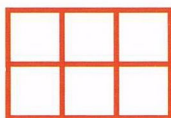
Crazy cubes

Some of these shapes will fold up to make a cube. Some of them won't. Draw a circle around each one you think will fold up to make a cube.

1



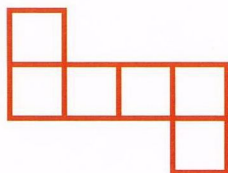
2



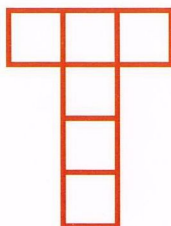
3



4



5

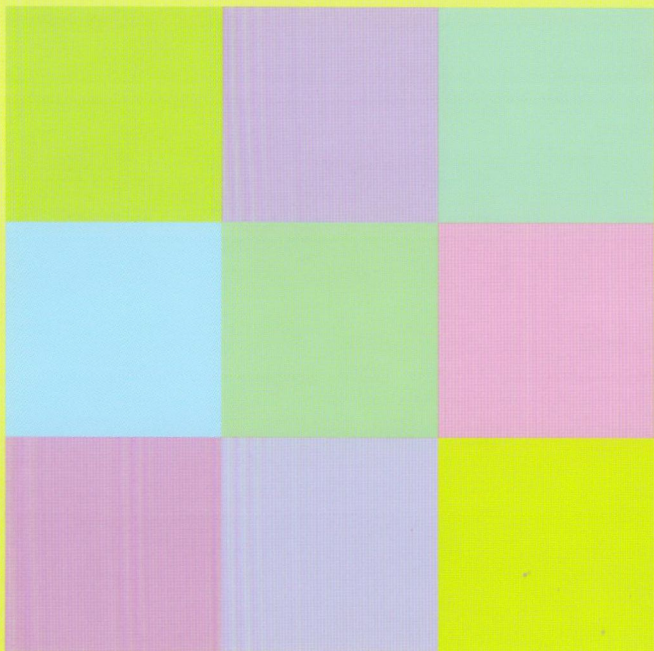


Fifteen



Fifteen

There are nine squares in the grid below. The aim is to write the numbers 1 to 9 in the grid so that each horizontal, vertical and diagonal line adds up to 15.



The two mice



The two mice

When Dobbin the donkey arrived at the farm, he was rather annoyed to find two mice blocking his way into the stables. Each mouse was guarding a different door.

"Get out of my way!" Dobbin said to the mice.

"You're only allowed to go through one of the doors," said Percy the pig, who was passing by.

"Behind one door is a bucket full of juicy carrots and a trough of cool water. There's nothing to eat or drink at all behind the other door."

"But how do I know which door leads to the carrots and water?" asked Dobbin.

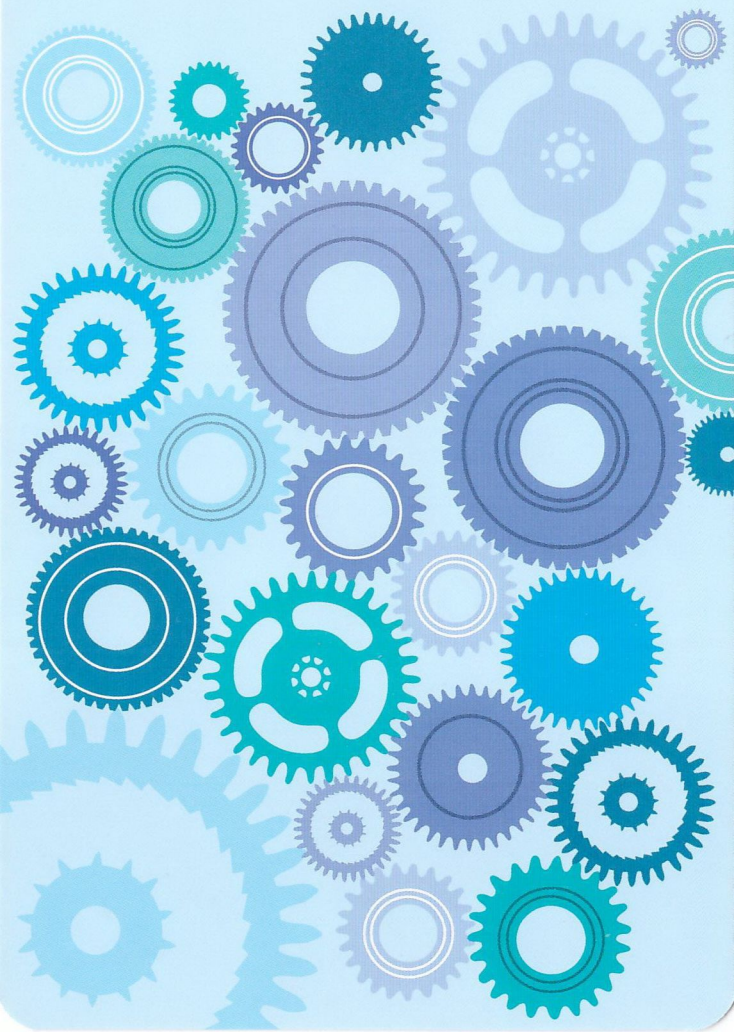
"Just ask one of the mice," Percy answered.

"But, you can only ask one mouse one question. One mouse always lies and the other always tells the truth."

Dobbin thought hard, but he didn't know what to do. Do you know what question Dobbin should ask one of the mice to help him choose the right door?

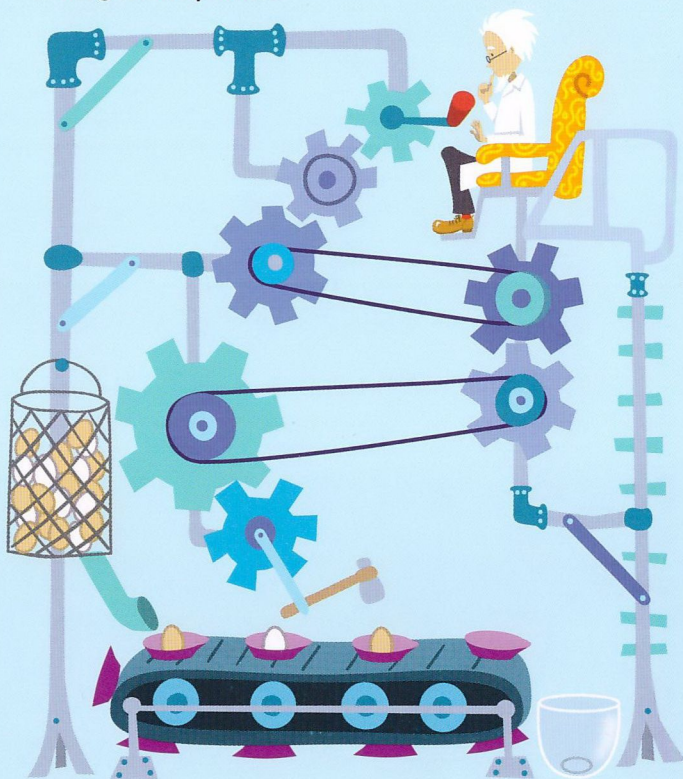


The machine



The machine

A professor has finally completed a crazy egg-smashing machine. The problem is, he can't remember which way to turn the machine's handle to make it break the eggs. Can you help him?



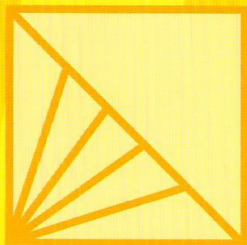
Puzzling pattern



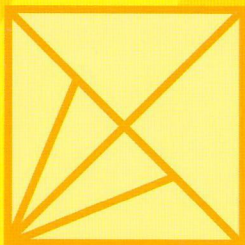
Puzzling pattern

The four boxes below follow a pattern. See if you can figure out the pattern, then fill in the blank box.

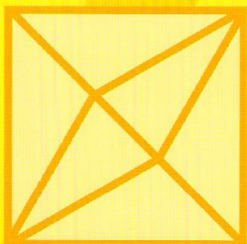
1



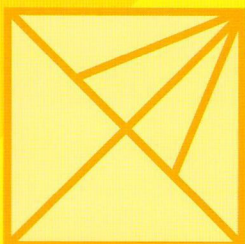
2



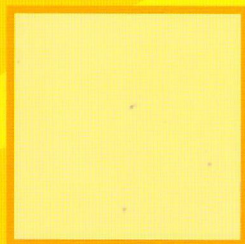
3




4



Answer:

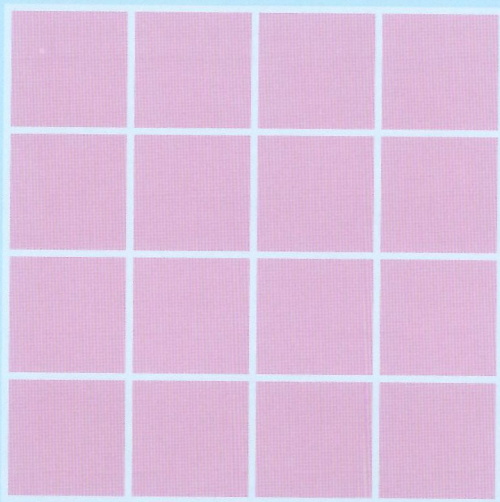




Searching for squares

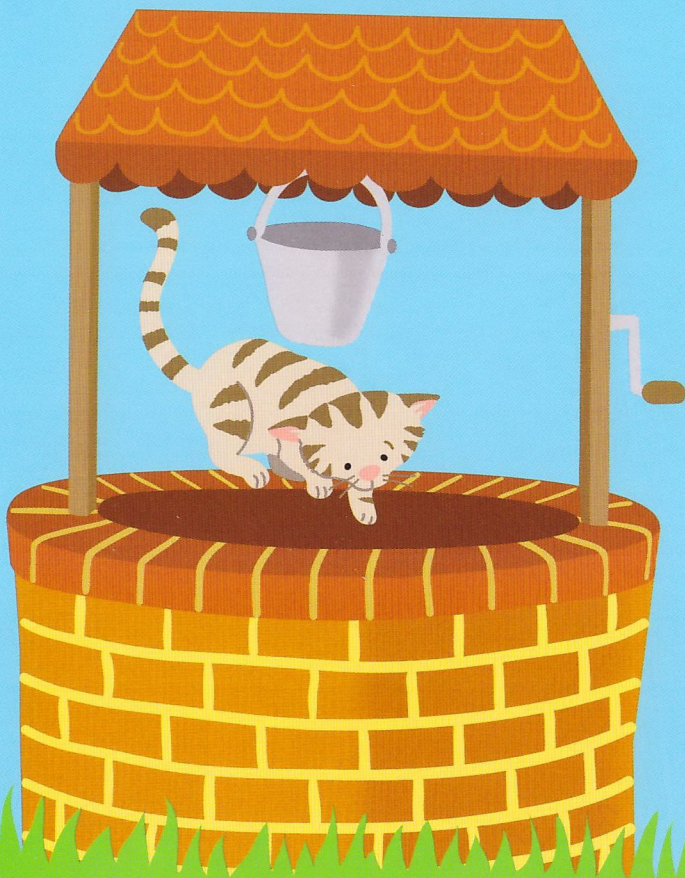
Searching for squares

When you first look at the picture below, it's easy to count 16 squares – but there are a lot more than that! Can you find them all? Use the pen to help you figure out how many squares there are, then write the answer.



Answer:

The cat in the well

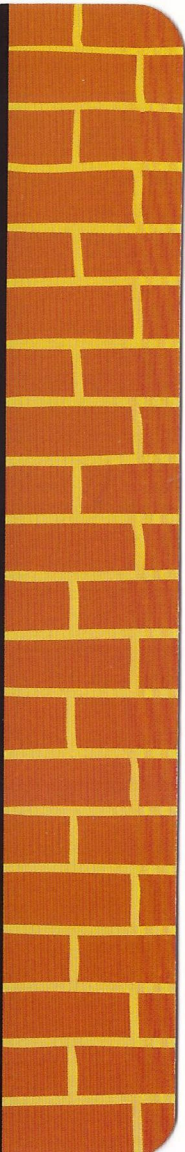


The cat in the well

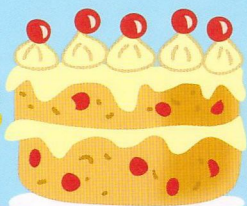
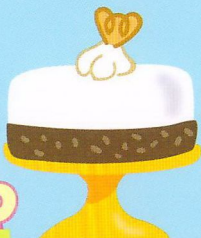
Tabby the cat was feeling very curious one day, and decided to jump down a well to see what was at the bottom. Unfortunately, she didn't find anything interesting down there – and didn't have a plan for how to get out again!

The wall of the well was made of large red bricks, and was 20 bricks high. Tabby dug her claws into the cracks between the bricks and pulled herself up by five bricks every day. This was very tiring for poor Tabby, and every night she'd slide back down four bricks. How many days did it take Tabby to reach the top of the well?

Answer:



Counting cakes



Counting cakes

The scales in these pictures are all evenly balanced. However, the last set of scales is missing its cupcakes. Can you figure out how many are needed to balance the scales? Draw them on.



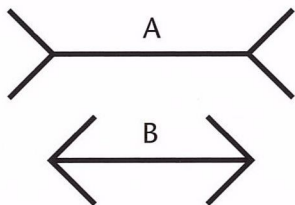


Optical
illusions

Optical illusions

Look closely at these pictures, then answer the questions. The answers may not be quite what you expect...

Which of these lines is longer, A or B?



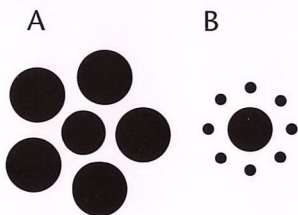
Answer: _____

Which line follows the same path as the white line – red, blue, yellow or green?



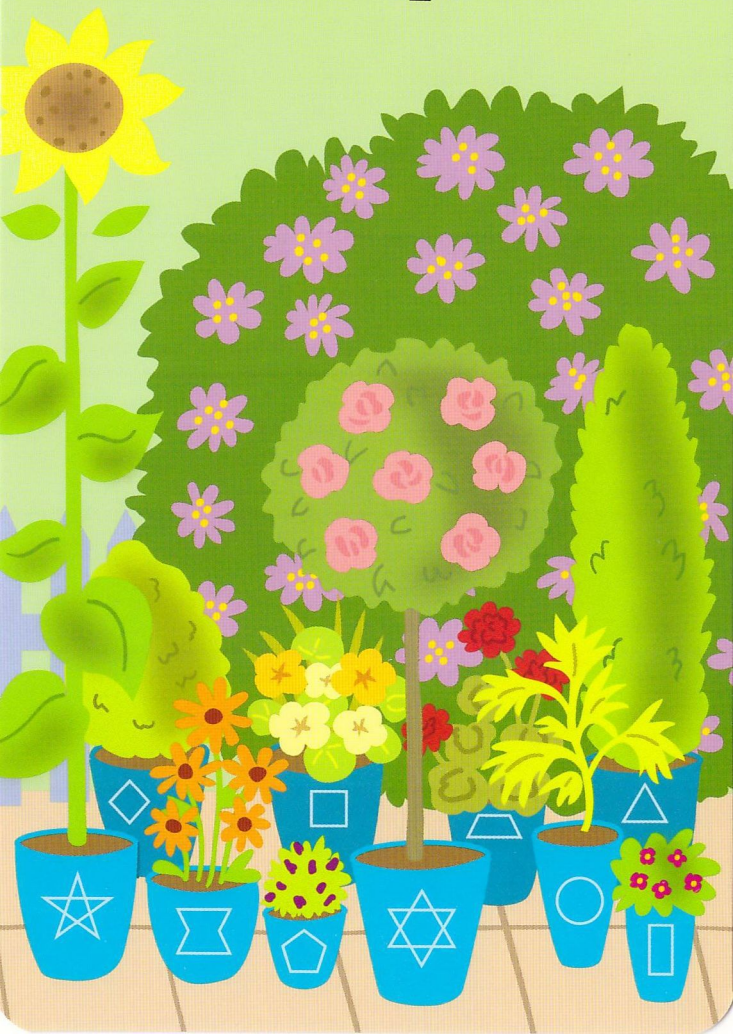
Answer: _____

Which of the middle circles is bigger, A or B?



Answer: _____

Flowerpots



Flowerpots

There are ten flowerpots that need placing in the garden below. They need to be arranged in five lines, with four pots in each line.

The lines can go vertically, horizontally or diagonally and make up a familiar shape – the flowerpots below may give you a clue...

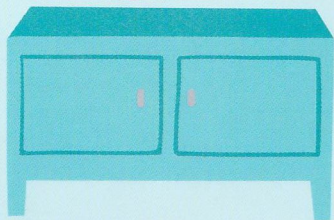
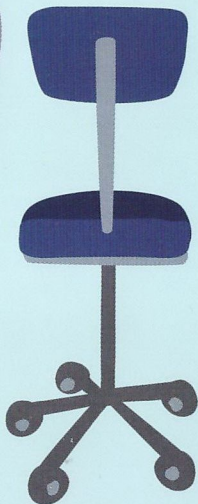
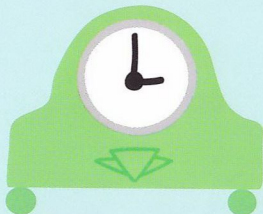


Odd one out



Odd one out

Look closely at the six pictures below. Can you spot which is the odd one out?



Answer:

Dominoes



Dominoes

Each row of dominoes follows a pattern. See if you can spot the pattern in each row, then fill in the missing dots on the blank dominoes.

1



2



3



Troll toll



Troll toll

Jake's best friend, Marie, lives on the other side of the valley. Jake doesn't go to her house very often, because of seven greedy, chocolate-eating trolls.

Each troll guards one of the seven bridges that Jake needs to cross to reach Marie's house. The trolls won't let him cross unless he pays a fee, or toll – in chocolate. Jake has to give each troll half of the number of chocolate bars he is carrying. However, even though the trolls are greedy chocolate-eaters, they aren't mean (or very clever), so each troll always gives back one bar.

Jake has figured out exactly how many bars he needs to take with him to be able to pay the seven troll tolls, and have two bars left over – one for himself and one for Marie. Do you know how many bars he must take?

Answer:

Lost property

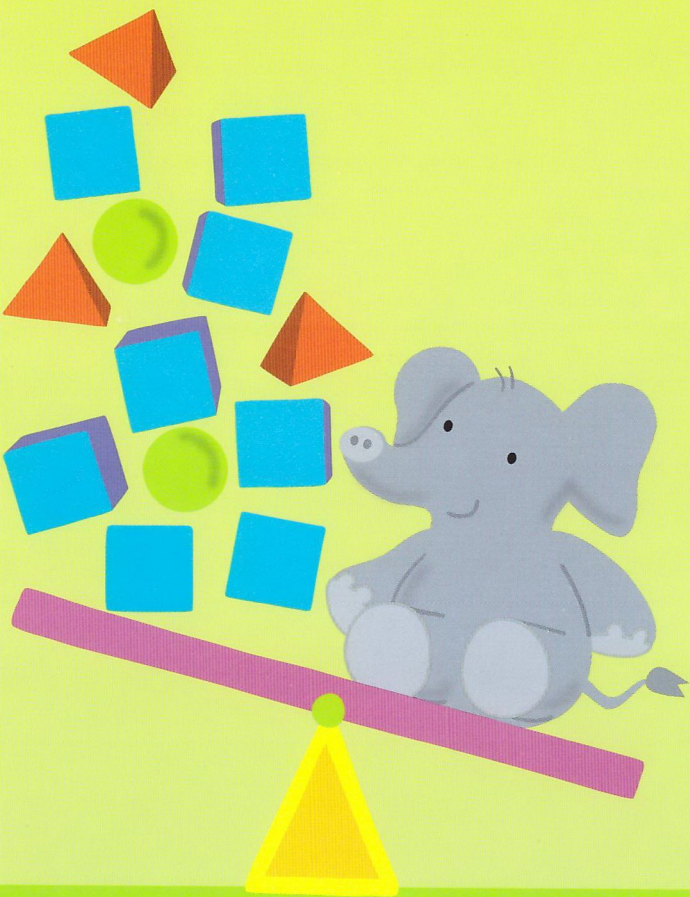


Lost property

Zak packed lots of useful things to take on his trip away. You can see them all in the picture below. But when Zak came home and started to unpack, he found that something was missing. Look at the objects scattered below for 30 seconds, then turn the card over and look at what Zak brought back. Can you spot what he left behind?

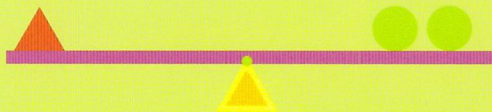
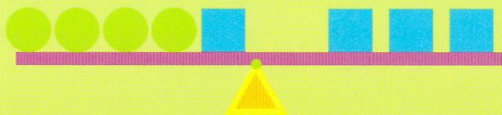
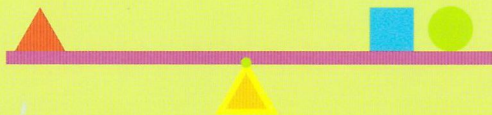


See-saw



See-saw

A triangle, a square and a circle each weigh a different amount. All the see-saws are perfectly balanced except the last one, which is missing one shape on the right-hand side. Which shape will make the see-saw balance? Draw it on.



Shearing sheep

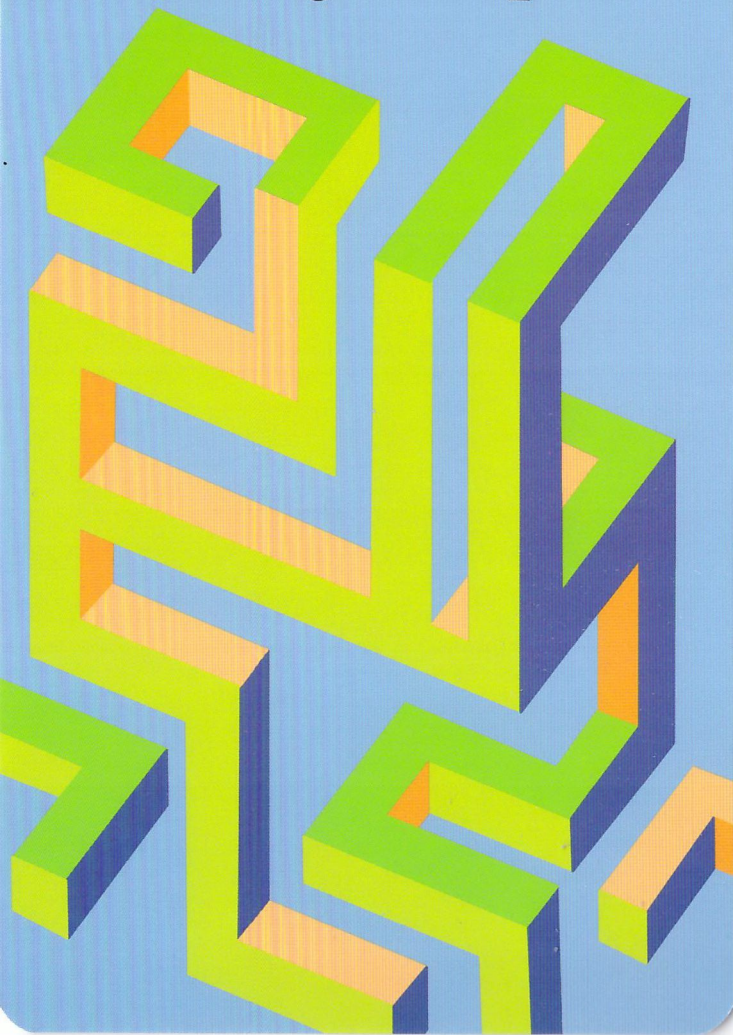


Shearing sheep

Nine sheep have been herded together and need to be put in separate pens so the farmer can shear them. Draw three squares around the sheep and see if you can put them all in their own pens. No curved lines are allowed.



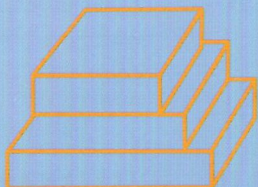
Strange shapes



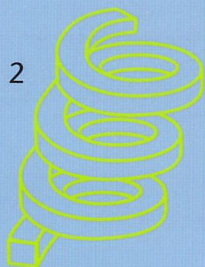
Strange shapes

Some of the shapes below are very unusual. They can be drawn on paper, but they cannot actually exist in real life – they are impossible shapes. Can you figure out which of the shapes are possible, and which are impossible? Put a circle around the impossible shapes.

1



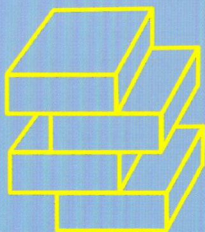
2



3



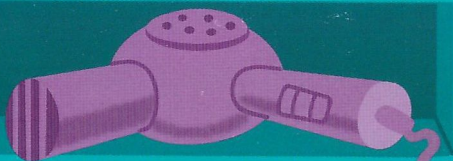
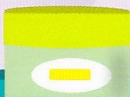
4



5



Cutting hair



Cutting hair

Emma went to visit her Aunt, who lived on a very small island. One day, Emma wanted to get her hair cut. Her Aunt told her that there were only two hairdressers on the whole island, so Emma decided to visit both before choosing where to go.

She looked in the window of the first hairdresser's shop, and saw that the place was filthy. The hairdresser's own hair was very uneven and was badly dyed.

The second hairdresser's shop was clean and tidy, and Emma noticed that the hairdresser had very nice hair.

After seeing this, she went straight back to the first hairdresser's shop and got her hair cut there.

Why would she do this?



**Spiders and
flies**

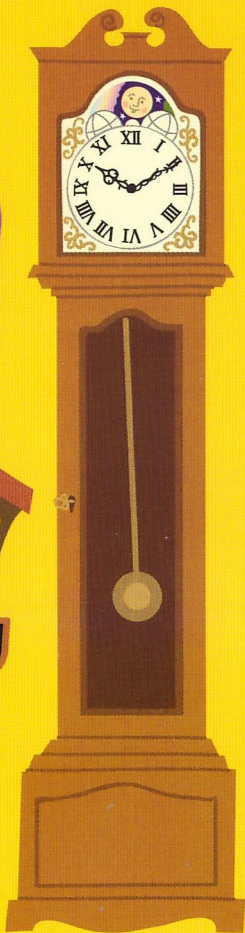
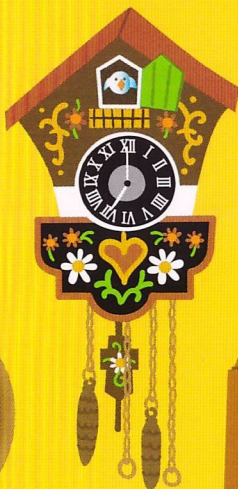
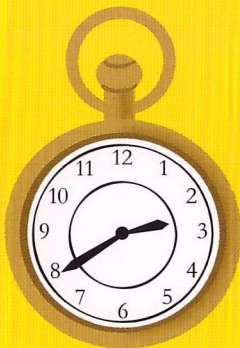


Spiders and flies

Every hungry spider needs a fly to eat. Using only two straight lines, can you divide the web below into three areas, with two spiders and two flies in each one?



Telling time



Telling time

Each column of clock faces has a pattern. Can you figure out what the patterns are, then fill in the hour and minute hands on the blank clock faces?



A



B



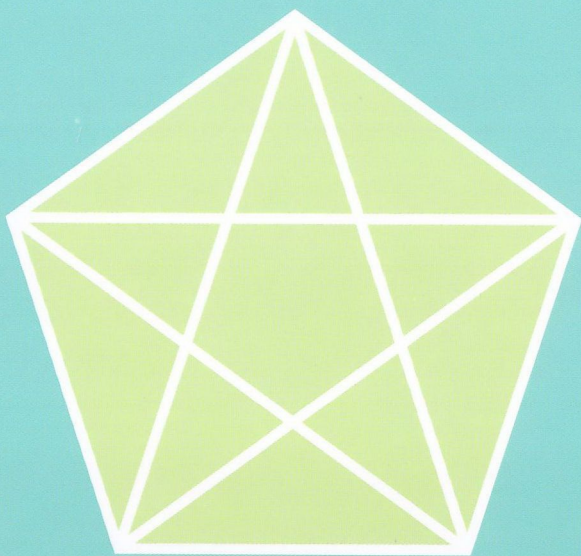
C



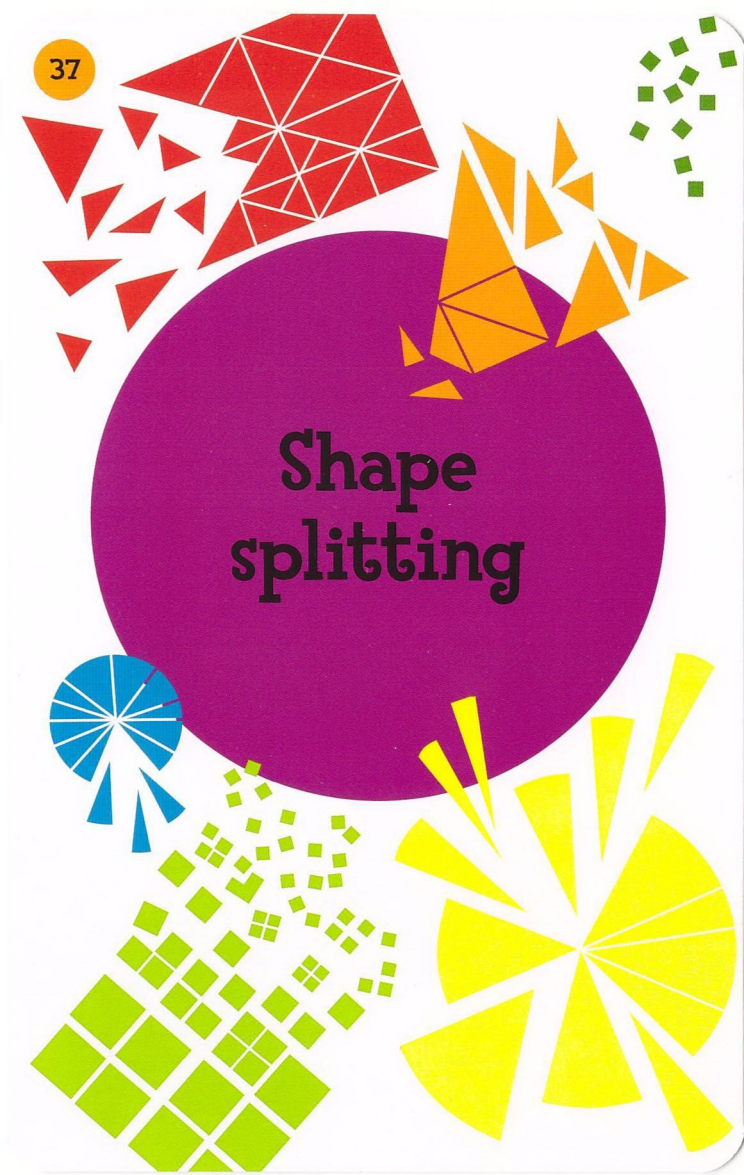
So many triangles

So many triangles

How many triangles can you find in the shape below? Draw over the lines in the shape to help you spot the triangles. There are more than you might think, so keep searching.



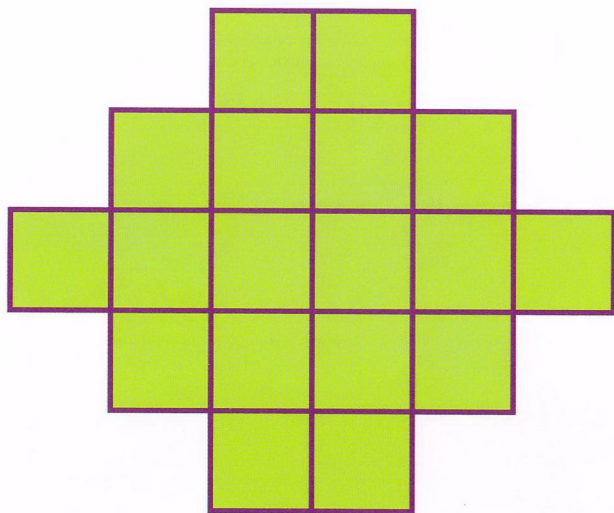
Answer:

The page features a central purple circle containing the text "Shape splitting". Surrounding this circle are several abstract geometric elements: a large red shape at the top left composed of many small triangles; a cluster of orange triangles at the top right; a group of green squares at the top right; a blue circular shape with radiating lines and triangles at the bottom left; a large yellow shape at the bottom right composed of many triangles; and a green grid-like pattern at the bottom left. The overall design is vibrant and geometric.

Shape splitting

Shape splitting

Use the pen to divide the shape below into six identical shapes that are made up of whole squares. There can't be any squares left over.



Alphabet puzzle



Alphabet puzzle

In this puzzle all the letters of the alphabet have been split into two groups. What's different about the two groups of letters? Write your answer underneath.

A E F H I K
L M N T V
W X Y Z

B C D
G J O P
Q R S U

Answer:

Magician's cups



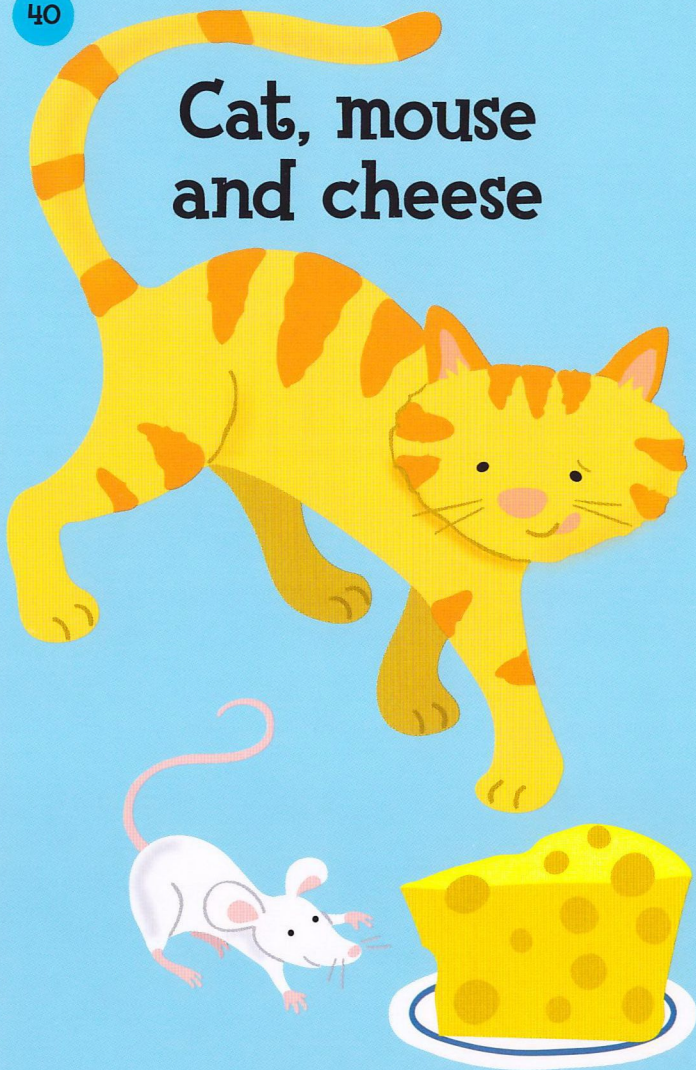
Magician's cups

Mungo the Magician always starts his act with a challenge for the audience. He places ten cups upside down in the shape of a triangle, then asks, "Can anyone move just three of the cups so that the triangle is pointing down instead of up?"



Try your hand at Mungo's challenge. Copy this triangle below, then erase three cups and draw them in their new positions.

Cat, mouse and cheese



Cat, mouse and cheese

You are standing on one side of a river with a cat, a mouse, and a big piece of cheese. You need to take the cat, mouse and cheese across to the other side of the river, but you can only take over one thing at a time.

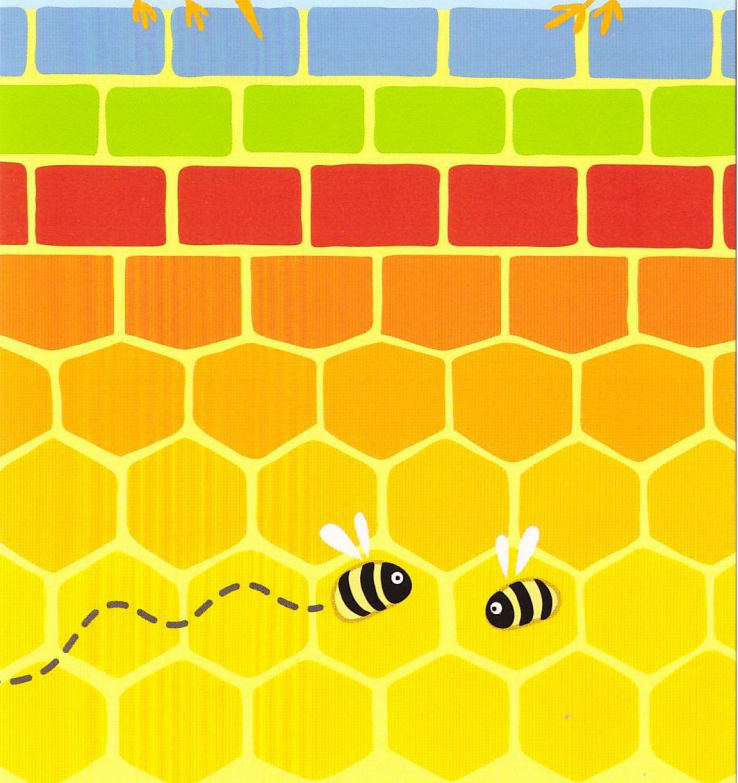
If you leave the cat and mouse alone together, then the cat will eat the mouse.

If you leave the mouse and the cheese together, the mouse will eat the cheese.

How can you take the cat, mouse and cheese across the river in the fewest number of crossings?



Six bricks



Honeycomb

41

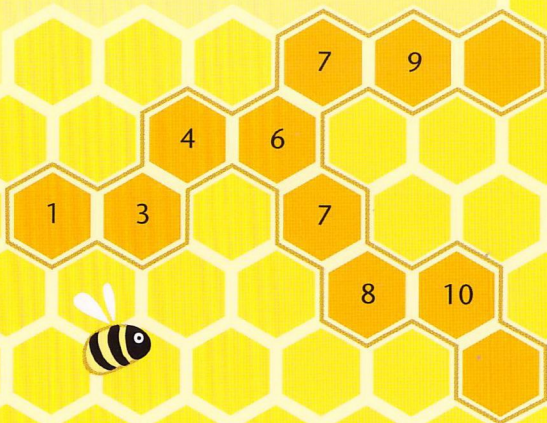
Six bricks

You have three pairs of bricks – one pair is red, one pair is green and one pair is blue. The bricks in each pair weigh the same as each other, and all six bricks are the same size. One pair of bricks is heavier than the others. You have some scales to weigh the bricks, but you're only allowed to use them once. How can you find out which pair of bricks is the heaviest?

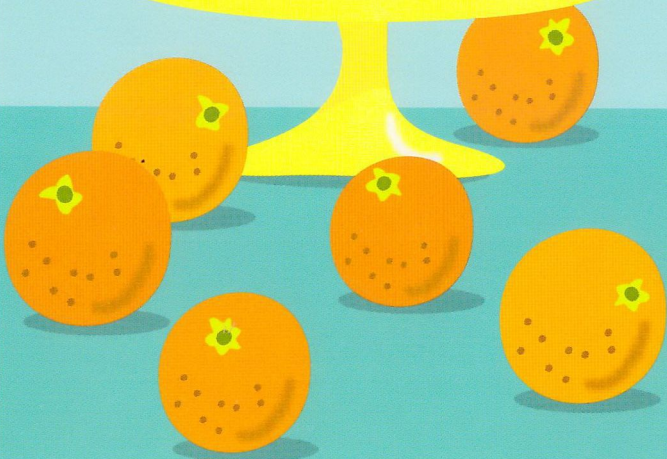
42

Honeycomb

Can you fill in the missing numbers?



Tricky questions



Tricky questions

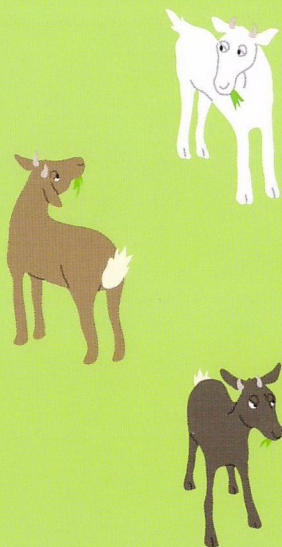
1. A greedy girl bought ten cream cakes and ate all but four. How many did she have left to share with her friend?
2. What's special about the following sentence? 'The quick brown fox jumps over the lazy dog.'
3. How many times can you take away 9 from 39?
4. If two people can dig two holes in two days, how long does it take one person to dig one hole?
5. If yesterday's tomorrow was Thursday, what day is tomorrow's yesterday?
6. You have a bag full of six oranges. How can you give an orange each to six people, and still have one left in the bag?

Fencing goats



Fencing goats

Three gruff, grumpy goats need to be put in separate pens to stop them from fighting. Use the pen to draw seven fences around the goats, making sure that the fences don't cross each other. Use the fence post at the side as a guide for the length of each fence.

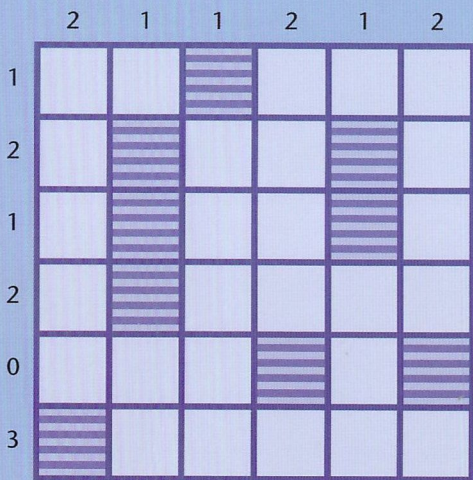


Stripes and stars

Stripes and stars

The aim of this puzzle is to draw stars in the grid below, but there are rules about where stars can and can't be placed:

1. Every striped square must have one star next to it, either horizontally or vertically.
2. Stars cannot be placed next to each other vertically, horizontally or diagonally.
3. The numbers next to the grid show how many stars must be in that row or column.

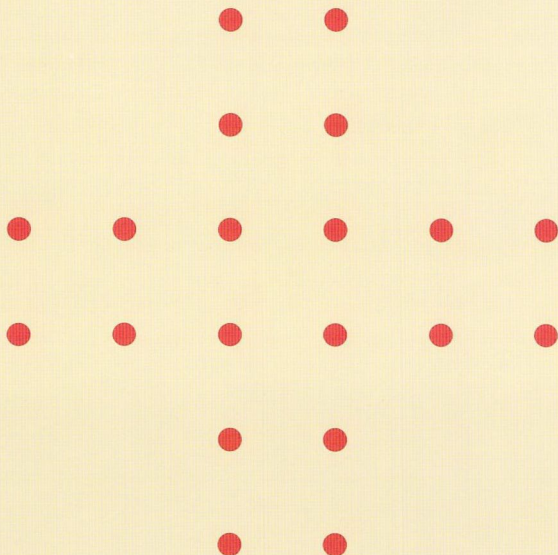


The page features a vibrant, abstract geometric design. At the top, a horizontal yellow band contains several large circles in shades of orange and red, some with concentric rings. Below this, the title 'Joining dots' is centered in a bold, black, sans-serif font. The lower half of the page is filled with a complex pattern of vertical and horizontal lines in yellow and orange, intersected by numerous circles of various sizes and colors (red, orange, yellow). Some circles are solid, while others are concentric, creating a layered, molecular-like structure. The overall aesthetic is mid-century modern and playful.

Joining dots

Joining dots

On the grid below, you can make lots of squares by joining four dots with straight lines. See how many squares you can make. (Don't forget that you can draw diagonal lines too.)



Crossing the bridge



Crossing the bridge

Ellie, Josh, Isaac and Mia need to cross a rickety old bridge to get home. It's dark, and no one wants to cross the bridge without the lantern – but it's only safe for two people to cross at a time. Each person walks at different speeds:

Ellie can cross the bridge in 1 minute.

Josh can cross the bridge in 2 minutes.

Isaac can cross the bridge in 5 minutes.

Mia can cross the bridge in 10 minutes.

They only have 17 minutes to get to the other side or they'll be late home. How can they do this? Draw on the other side of this card to help you solve the puzzle.

Butterfly twins



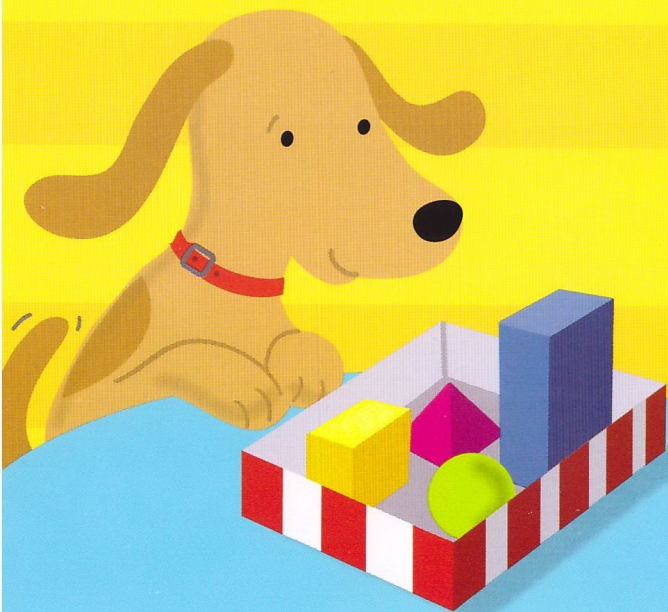
Butterfly twins

One of the butterflies below is the identical twin of the one on the other side of this card. Draw a circle around it.



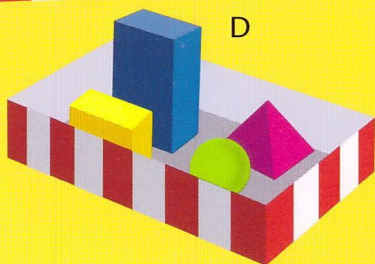
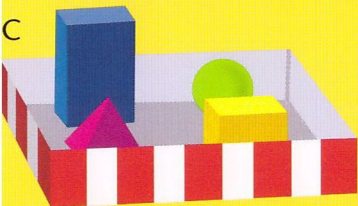
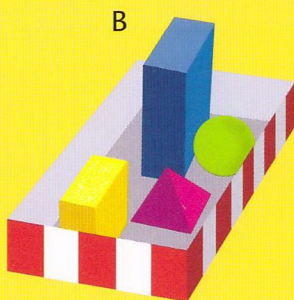


Points of view



Points of view

The trays A, B, C and D all look like the tray on the other side of this card shown from different angles. However, only one of the trays has the shapes inside arranged in exactly the same way. Draw a circle around the one that matches.



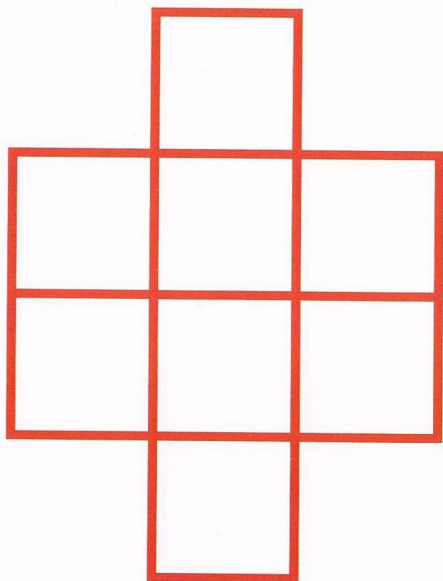
Letters apart

E A F H
C
D
B
G

A
G F D E C B H

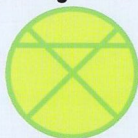
Letters apart

The aim of this puzzle is to write the first eight letters of the alphabet (A, B, C, D, E, F, G and H) in the boxes below. Can you fill in the boxes so that none of the letters that are next to each other in the alphabet are in boxes that are touching either horizontally, vertically, or diagonally?



Answers

1. **Splitting a circle:**



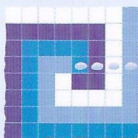
2. **Spot the difference:**



3. **Magic bean:**

Thursday of the second week.

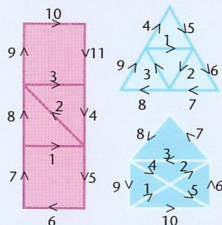
4. **Silly squabble:**



5. **The magic number:**

The answer is always 7.

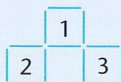
6. **Non-stop draw:** The numbers by each picture show you the order in which to draw the lines.



7. **Making squares 1:**



8. **Making squares 2:**



9. **Half hexagon:** 1, 4.

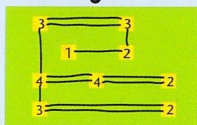
10. **Toy blocks:** Put the umbrella block on top of the sun block, to make a plus shape with six blocks in each row.

11. **Riddles:** 1. Alex was too short to reach the twelfth button in the elevator.
2. The hat, scarf and lumps of coal had once belonged to a snowman that had melted because it was a warm day.

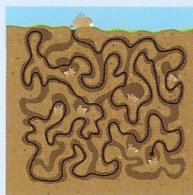
Answers

12. **Silly sentence:** The words 'sentence' and 'mistakes' have been misspelled. The third mistake is that there are only two mistakes, not three!

13. **Drawing lines:**



14. **Rabbit burrow:**



15. **Word ladders:** Here is one way to complete each word ladder:

1. JAW. 2. WIND, BIND. 3. HEAD, HELD, HOLD.

16. **Crazy cubes:** 1, 4, 5.

17. **Fifteen:**

6	7	2	2	7	6	8	3	4	4	3	8
1	5	9	9	5	1	1	5	9	9	5	1
8	3	4	4	3	8	6	7	2	2	7	6

18. **The two mice:** Dobbin should ask either of the mice: "Which door would the other mouse tell me to go through to get to the carrots and water?" If the mouse was lying, it would say that the truthful mouse would point to the wrong door. If he asked the mouse that was telling the truth, then it would say that the lying mouse would point to the wrong door. So, whichever door the mouse points to, Dobbin should choose the other door.

19. **The machine:** The handle must be turned clockwise.

Cogs joined like this turn the opposite way to each other.

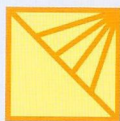


Cogs joined like this turn in the same direction.



Answers

20. **Puzzling patterns:**



21. **Searching for**

squares: There are 30 squares.

22. **The cat in the well:**

16 days – Tabby climbs out of the well before she slides down that night.

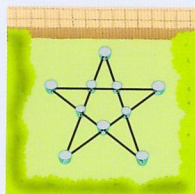
23. **Counting cakes:**

Five and a half cupcakes.

24. **Optical illusions:**

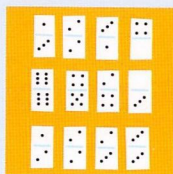
1. They are the same.
2. Yellow.
3. They are the same.

25. **Flowerpots:**



26. **Odd one out:** The chair is the odd one out, because it's the only object with its back facing you.

27. **Dominoes:**

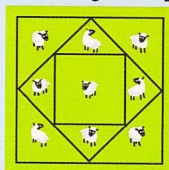


28. **Troll toll:** Two bars. Every time Jake gave a troll half of his chocolate (one bar), the troll would give it back.

29. **Lost property:** The missing item is an orange.

30. **See-saw:** There is a green circle missing from the right-hand side of the see-saw.

31. **Shearing sheep:**



Answers

32. **Strange shapes:**

1, 3, 5.

33. **Cutting hair:** As there were only two hairdressers on the island, they must cut each other's hair. Therefore, the one with the worst hair must be the better hairdresser.

34. **Spiders and flies:**



35. **Telling time:**

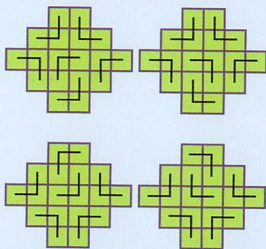
A. Quarter past three.

B. Quarter to ten.

C. Quarter to twelve.

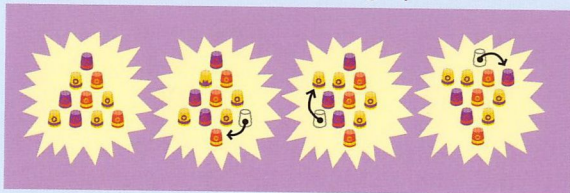
36. **So many triangles:**
There are 35 triangles.

37. **Shape splitting:**



38. **Alphabet puzzle:** All the letters in the left-hand bubble are made of straight lines only. All the letters in the other bubble have some curved lines too.

39. **Magician's cups:** The arrows show you where to move the cups to make the triangle point down.



Answers

40. Cat, mouse and cheese:

1st crossing: Take the mouse across, leave it there.

2nd crossing: Go back alone.

3rd crossing: Take the cheese across, leave it there.

4th crossing: Return with the mouse, leave it there.

5th crossing: Take the cat across, leave it there.

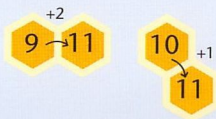
6th crossing: Go back alone.

7th crossing: Take the mouse across.

This answer is also correct if you take the cat on the 3rd crossing (instead of the cheese) and take the cheese on the 5th crossing (instead of the cat).

41. **Six bricks:** To find out which pair of bricks is heaviest, weigh any two bricks from different pairs. If they balance, then the pair of bricks that have not been weighed is the heaviest. If they don't balance, then you'll see that the heavier brick belongs to the heaviest pair.

42. **Honeycomb:** Both missing numbers are 11. When two honeycombs are next to each other, the numbers go up by 2. When they are attached diagonally, the numbers go up by 1.

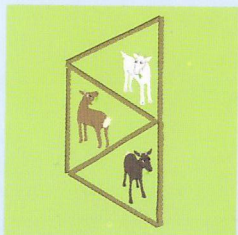


43. Tricky questions:

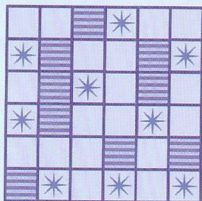
1. Four.
2. The sentence contains every letter in the alphabet.
3. You can only take away 9 from 39 once, because then you don't have 39 anymore.
4. One person would take two days to dig one hole.
5. Thursday.
6. When you give out the last orange, give it inside the bag.

Answers

44. **Fencing goats:**



45. **Stripes and stars:**



46. **Joining dots:** There are 21 squares to find.

47. **Crossing the bridge:**

1. Ellie (1 min) and Josh (2 mins) cross the bridge (total = 2 mins).
2. Josh (2 mins) returns to the other side (total = 4 mins).
3. Isaac (5 mins) and Mia (10 mins) cross the bridge (total = 14 mins).
4. Ellie (1 min) returns to the other side (total = 15 min).
5. Ellie (1 min) and Josh (2 mins) cross the bridge (total = 17 mins).

48. **Butterfly twins:** 7

49. **Points of view:** C

50. **Letters apart:** Here are ways to fill in the shape:

